

DAKOTA™ Model 65 Transplanter Operator's Manual



WARNING

Before operating, locate all overhead and buried lines. Call your locator service.

LIMITED WARRANTY

Dakota Peat & Equipment, hereinafter called Dakota, extends a Limited Warranty on the products it manufacturers to be free from defects in material and workmanship for a period of one (1) year from the date of delivery to the purchaser. This Limited Warranty covers the Tree Transplanter and is made to the original purchaser only. Under this Warranty, parts and labor are covered for replacement of warrantable parts or components as determined by Dakota. Dakota reserves the right, at its option, to either repair or replace the warrantable parts either in the field or at the factory, transportation prepaid, in East Grand Forks, Minnesota.

The Warranty is void if the product has been subjected to abuse, misuse, misapplication, neglect (including but not limited to improper maintenance and cleaning), accident, improper installation, modification (including but not limited to use of unauthorized parts or attachments), and improper adjustment or repair. Component parts furnished with Dakota products which are not manufactured by Dakota are not warranted by Dakota, but are warranted according the manufacturer of the component part.

THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. IMPLIED WARRANTIES INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO A PERIOD OF ONE YEAR. Under no circumstances shall Dakota be obligated for incidental or consequential damages. This Warranty gives you specific legal rights, and you may also have other rights which may vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so certain limitations or exclusions under this Warranty may not apply to you.

It is expressly understood that the liability of Dakota for its products, whether due to breach of warranty, negligence, strict liability, or otherwise, is limited to the furnishing or repair of such replacement parts. Dakota is not liable for any other injury, loss, damage, or expense, whether direct or consequential, including but not limited to loss of use, income, profit, production, increased cost of operation, spoilage of or damage to products arising in connection with the sale, installation, use or inability to use, or the repair or replacement of Dakota products.

Any operation expressly prohibited in the operating instructions or manuals furnished with the product, or any adjustment or assembly procedure not recommended or authorized in the operating or service instructions shall void such warranty.

No one is authorized to modify this Warranty or to make additional warranties on behalf of Dakota.

Dakota reserves the right to change, modify, or improve its products without obligation to retrofit existing models.

Dakota is not liable for any accidents or damage which may occur from the operation of its equipment. The purchaser assumes all responsibility for proper installation, use, care, maintenance, and safe operation.

This Warranty is void if the serial number has been removed or altered in any way.

This warranty is void if the signed warranty registration card is not returned to Dakota within 30 days of purchase along with a copy of the original purchase invoice.

Service parts (except electrical) sold and distributed by Dakota carry a 30 day warranty from date of sale.

All warranty claims should be made through the dealer it was purchased from and proof of serial number and purchase date must be provided when the warranty claim is made. All warranty claims must be preauthorized by Dakota.

WARRANTY PROCEDURE

At the time of purchase, a warranty registration is to be signed by both the selling dealer and you, the owner. Maintain your copy of the warranty registration in a safe place where it can be easily accessed if warranty service is suspected.

If you suspect that the Tree Transplanter has a condition in which warranty service may be required, contact your Dakota dealer. Your dealer is the primary source for service and warranty work. Your dealer will then inspect the Tree Transplanter and, if necessary, contact the factory for the proper warranty authorization. In the event that your dealer has ceased doing business, contact Dakota for information as to your closest dealer.

Our warranty is provided to support customers who operate and maintain their equipment as described in this manual. This warranty provides you the assurance that **DAKOTA** will back its products where defects appear within the warranty period. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements will be denied.

CONGRATULATIONS

Congratulations on the purchase of the Dakota™ Model 65 Tree Transplanter. We specifically welcome you to the fine line of Dakota Equipment products. Designed, engineered, and manufactured to rigid specifications and standards, superior quality is the #1 goal of Dakota Equipment. By producing a high quality product, we can attain the highest levels of customer satisfaction.

FOREWORD

This manual is to be used as a guideline for operation and maintenance of the Tree Transplanter.

Owners and operating personnel must thoroughly read and understand this manual in order to properly operate, lubricate, and maintain the Tree Transplanter. Failure to do so could result in personal injury or equipment damage. Refer to this manual as frequently as necessary.

With proper maintenance, the Tree Transplanter will give many years of service; however, if replacement of any component is desired, be sure the Tree Transplanter is in a secure position and the truck engine shut off and the parking brake set. If replacement parts are needed, order genuine Dakota parts from your dealer for the correct fit and function.

SPECIFICATIONS

Dimensions

Dry Weight	14000 lb
Working Width, Gate Closed	101 in.
Working Width, Gate Open	150 in.
Clearance Between Open Gate	30in.
Height (transport position)	99 in.
Height* (upright position)	163 in.
Width (overall)	102 in.
Pivot to spade centerpoint	65 in.
Hole (width)	65 in.
Hole (depth)	36 in.

* not including truck frame height

Capacities

Water Tank	420 U.S. gal.
Hydraulic Oil Reservoir	50 U.S. gal.
Rootball Weight (approximate)	3000 lb

Hydraulic System

Operating pressure	3500 psi
Flow rate (Transplanter)	20 gpm
Flow Rate (water pump drive)	10 gpm
Hydraulic Filter	Dakota p/n 13611

Recommended Lubricants

Hydraulic Fluid	HDZ-46
Grease	EP-2 Lithium-based

Transmitter

Weight	6.7 Ounces
Dimensions	4.8x2.2x1.4 in.
Batteries (2)	AA Alkaline
Operating Range	300 ft
Antenna	Internal Circuit Board
Mode Switches	2
Function Switches	11

TRANSPANTER IDENTIFICATION NUMBERS

MODEL # _____ SERIAL # _____

OPERATING PRECAUTIONS

WARNING

Before operating, locate all overhead and buried lines. Call your locator service.

WARNING

Do not operate the Tree Transplanter below or within 15 feet (5m) of any overhead power lines. If necessary to work within this clearance, notify the power company to de-energize and/or move the power lines.

WARNING

Whenever operating the Transplanter, do not allow anyone too close [within 10 feet (9m)] of the Transplanter.

WARNING

Operating the Tree Transplanter in a manner or purpose for which it is not designed for may result in personal injury and damage to the Tree Transplanter.

WARNING

Operation of the Tree Transplanter by someone other than a trained operator may result in personal injury or damage to the Tree Transplanter. Read and understand the entire Operator's Manual prior to operating the Tree Transplanter.

WARNING

Whenever the truck PTO is engaged with the engine running, hydraulic fluid at extreme pressure and high temperature will be present.

WARNING

Stay clear of all pinch points and moving parts. Do not wear loose fitting clothing when operating the Tree Transplanter.

WARNING

Do not attempt to move trees with a trunk diameter larger than 8 in.

WARNING

Do not transport trees or plugs with the Tree Transplanter in the vertical position. Only transport in the stowed position.

CAUTION

Be sure to disengage the power take off before operating the truck engine at speeds above 1500 rpm. Damage to the hydraulic system or pump may result from excessively high rpm.

CAUTION

When in the stow position, do not fully raise the spades. Damage to the frame supports will result.

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GENERAL INFORMATION

LABELING AND TERMINOLOGY

The Transplanter and this manual use the following terms and symbols to bring attention to the presence of hazards of various risk levels and important information concerning the use and maintenance of the Transplanter.

WARNING: Indicates presence of a hazard which can cause severe personal injury, death, or substantial property damage if ignored.

CAUTION: Indicates presence of a hazard which will or can cause minor personal injury or property damage if ignored.

NOTE: Indicates supplementary information worthy of particular attention relating to installation, operation, or maintenance of the Transplanter but is not related to a hazardous condition.

Be sure to follow all instructions and related precautions as they are meant for your safety and protection. This manual is considered a permanent part of the Transplanter and must remain with the Transplanter when sold.

Record the model and serial numbers (found on the left hand support) in the specifications section so they are readily available when contacting a dealer for parts or service.



AUTHORIZED MAINTENANCE

Perform only the maintenance described in this manual that you are qualified to perform. If major repairs are ever needed or assistance is desired, contact an Authorized DAKOTA Dealer for their professional service.

POWER OFF MAINTENANCE AND ADJUSTMENTS

All maintenance and adjustments to the Transplanter must be made with the transplanter in a secure position and the truck's parking brakes set, engine off, and key removed. Failure to do so could result in injury or even death.

MAINTAIN SAFE OPERATING CONDITIONS

Grease all fittings as described in this manual. Proper lubrication is essential for the safe operation and longevity of the Transplanter.

Daily, visually inspect the Transplanter for any abnormalities. Look for loose or broken hardware; bent or damaged components; broken or fatigued welds; leaking, worn or damaged hydraulic hoses and fittings.

RELIEVE HYDRAULIC PRESSURE

Before performing any work on the hydraulic system, all pressure in the system must be relieved. Place the Transplanter either in the transport position or firmly support the area being serviced. Make sure all parts of the Transplanter actuated by hydraulic pressure are supported or otherwise restrained to prevent movement prior to relieving hydraulic pressure.

Disengage the power take off; then turn off the transmitter and stop the truck engine. Using the special 1/2 in. wrench found in the manual canister, rotate the hex shaft of the appropriate valve to both ON positions. Residual hydraulic pressure may still be present, so care must be taken. Failure to do so could result in damage, injury, or even death.

KEEP TRANSPLANTER CLEAN

Keep the Transplanter free of excessive grass, leaves, and accumulations of dirt and sand. Materials such as this can compromise seals, bearings, and other components.

REPLACEMENT PARTS

To ensure optimum performance and safety, always purchase genuine DAKOTA replacement parts and accessories. NEVER USE "WILL-FIT" REPLACEMENT PARTS AND ACCESSORIES MADE BY OTHER MANUFACTURERS. Using unapproved replacement parts and accessories voids the warranty of the DAKOTA Transplanter. Right and left-hand sides are determined by sitting in the driver's seat of the truck.

If ever in need of a new remote, please provide DAKOTA the serial number of either the existing remote or receiver to ensure proper programming.

READ OPERATOR'S MANUALS

Prior to operating the Transplanter, read and understand the contents of this Operator's Manual and the Operator's manual of truck. Become familiar with all control functions and know how to operate the truck and Transplanter safely.

Replacement Manual

A replacement manual is available by sending complete Model and Serial Numbers to

Dakota, Inc.
833 Gateway Drive, North East
East Grand Forks, Minnesota 56721

UNAUTHORIZED OPERATORS

Never allow children to operate the Transplanter. Do not allow anyone to operate the Transplanter without proper instruction or training. Only trained and authorized persons should operate the Transplanter.

DRUGS AND ALCOHOL

Never operate the Transplanter when under the influence of drugs or alcohol.

SHIELDS AND SAFETY DEVICES

Keep all shields, guards, and safety devices in place. If a shield, guard, or safety device is damaged, replace or repair it prior to operating the Transplanter. If a decal is illegible, order and install a new one.

LOOSE FASTENERS AND FITTINGS

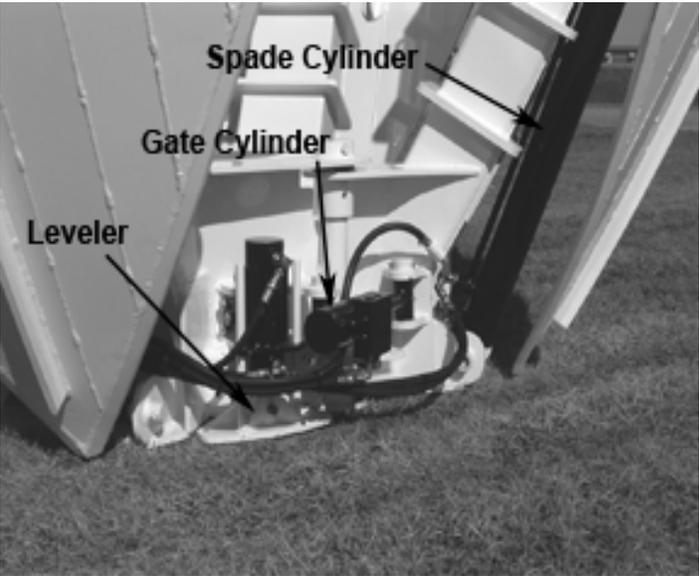
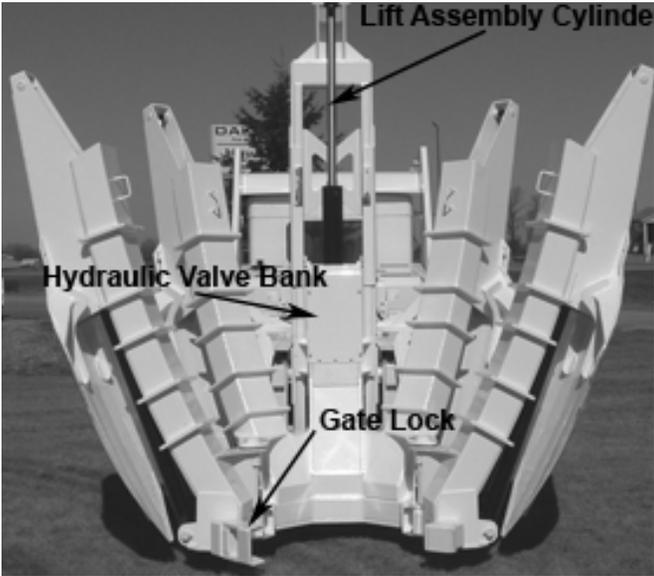
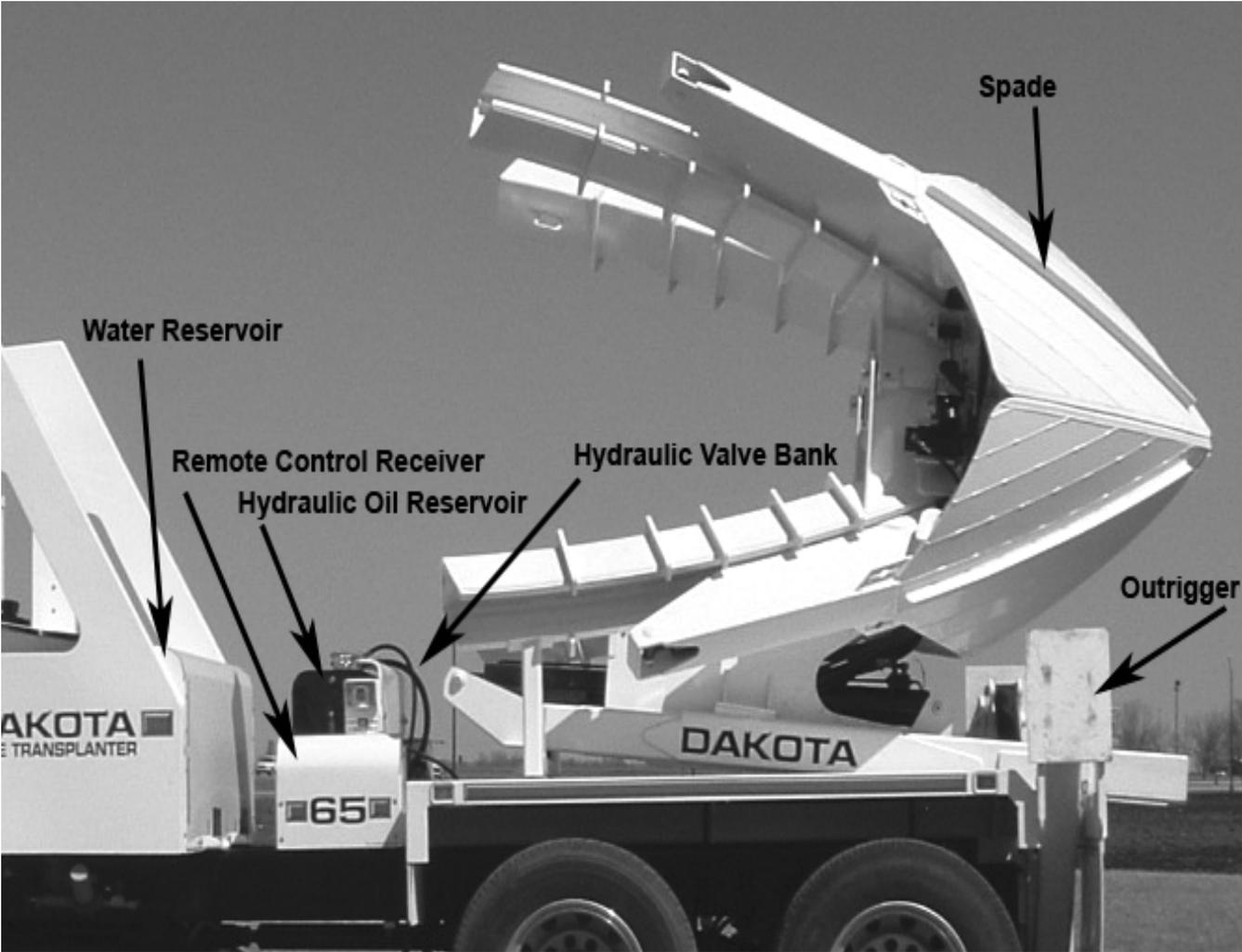
Although the Transplanter has been designed so that components will not come loose during normal operation of the Transplanter, always check the Transplanter prior to start up and after each use for loose fasteners, fittings, connectors, and other components. Tighten, repair, or replace as necessary. This includes electrical and hydraulic system components, also.

MODIFICATIONS TO TRANSPLANTER

Do not modify the Transplanter in any way. Modifying the Transplanter will void the warranty.

COMPONENT LOCATIONS

Fig. 1



OPERATION

TRANSMITTER

General information

The hand-held remote control transmitter controls all of the hydraulic and water functions of the Transplanter. The transmitter is powered by 2 AA batteries giving approximately 200 hours of continuous service on fresh batteries. Alkaline batteries are recommended. Do not use rechargeable batteries. If the remote detects that the batteries need to be replaced, an **L** will flash in the display on the lower left-hand corner of the remote. The remote has an operating range of 300 ft.

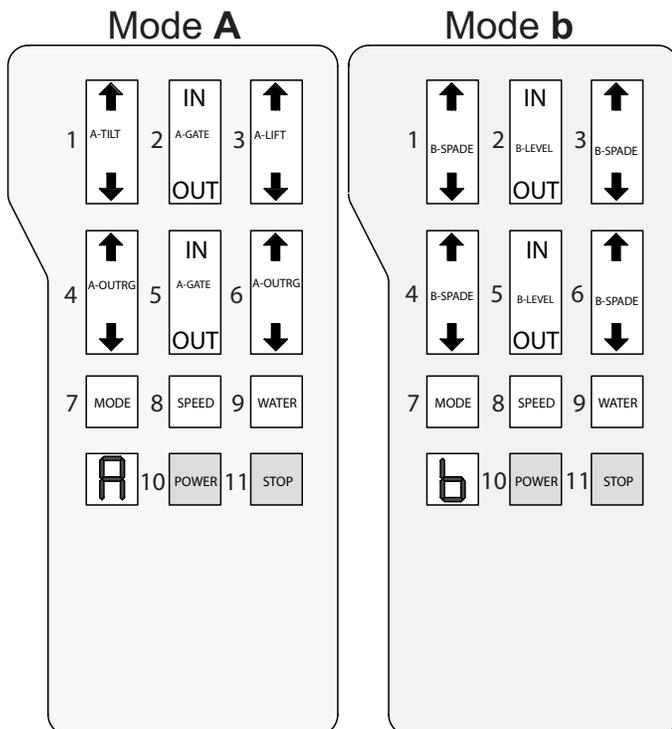
The remote operates in two modes and the remote switches are labeled to indicate their function in each of the two modes. The mode is displayed in the lower left corner of the remote. Every time the remote is first activated, it will be in mode **A**. Mode **A** will operate the mast tilt and lift, the outriggers, and the gates. Mode **b** will operate the spades, the levelers, and the water pump. It should be noted that the water pump will only work in Mode **b**.

Switch Function Review

Two groups of switches are located on the transmitter. The first group of switches involves the six, three-position rocker (ON/OFF/ON) switches that are located in the top two rows of the transmitter. These six switches control individual Transplanter functions depending upon the transmitter mode. The second group, located in the bottom two rows of the transmitter, contains 5 (ON/OFF) switches. These switches are the MODE, SPEED, WATER, POWER, and STOP.

The following explains the function of each switch. Refer the Fig. 2 for the specific location of each switch.

Fig. 2



Switch 1

Enabled in Mode **A** (Engage) and Mode **b** (Dig), Switch 1 controls the tilt in Mode **A** and the left front spade in Mode **b**.

Switch 2

Enabled in Mode **A** (Engage) and Mode **b** (Dig), Switch 2 controls the left gate in Mode **A** (Engage); and controls the left leveler in Mode **b** (Dig).

Switch 3

Enabled in Mode **A** (Engage) and Mode **b** (Dig), Switch 3 controls the lift in Mode **A** and the right front spade in Mode **b**.

Switch 4

Enabled in Mode **A** (Engage) and Mode **b** (Dig), Switch 4 controls the left outrigger in Mode **A** (Engage); and controls the left rear spade in Mode **b** (Dig).

Switch 5

Enabled in Mode **A** (Engage) and Mode **b** (Dig), Switch 5 controls the right gate in Mode **A** (Engage); and controls the right leveler in Mode **b** (Dig).

Switch 6

Enabled in Mode **A** (Engage) and Mode **b** (Dig), Switch 6 controls the right outrigger in Mode **A** (Engage); and controls the right rear spade in Mode **b** (Dig).

Switch 7 (MODE)

Activating Switch 7 places the transmitter into either Mode **A** (Engage) or Mode **b** (Dig). The display on the lower left-hand corner of the remote will identify the current mode.

Switch 8 (SPEED)

Enabled in Mode **A** (Engage), Switch 8 controls the cylinder speed of the tilt and lift between slow and fast. To increase or decrease the speed of the tilt or lift, press Switch 8 **while** the lift or tilt switch is activated. The speed of the cylinder will remain the same (either slow or fast) until changed by the operator. If the transmitter mode is changed, cylinder speed will return to slow speed. Pressing down on Switch 8 while holding down the POWER switch will toggle engine rpm between high and low engine idle.

NOTE: It is permissible to operate the transplanter with the engine running at low idle.

Switch 9 (WATER)

Enabled only in Mode **b** (Dig), Switch 9 opens and closes the water valve allowing water to flow down the face of each spade for lubrication and to soften the ground. A switch on the left-hand side of the transplanter allows the operator to divert water to either the wash down hose or the spades.

Switch 10 (POWER)

Enabled at all times, the POWER switch turns the transmitter power ON and OFF. The POWER switch must be held on for a period of 3 seconds in order to activate the remote.

Switch 11 (STOP)

Enabled at all times, pressing the STOP switch overrides all commands and immediately stops all Transplanter functions. The STOP switch also drops the engine rpm back to idle.

NOTE: If radio interference causes problems with the operation of the transplanter, the remote can switch radio channels to allow the transplanter to continue operating safely. To change channels press and hold the POWER switch and simultaneously press the MODE switch. The new channel will be displayed on the lower left corner of the remote.

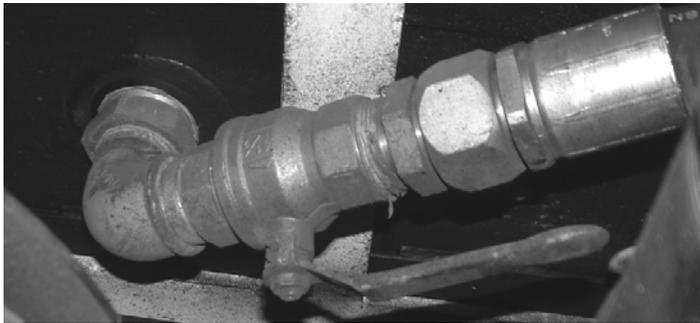
TRANSPLANTING PROCESS

General Information

Daily, check the hydraulic fluid level and visually inspect the Transplanter for any abnormalities. Look for loose or broken hardware; bent or damaged components; broken or fatigued welds; leaking, worn or damaged hydraulic hoses and fittings. Be sure the hydraulic shut-off valve located on the bottom of the hydraulic tank is in the ON position (lever aligned with hose) before operating the hydraulic system.

CAUTION

The hydraulic shut-off valve must be in the ON position before operating the Transplanter.



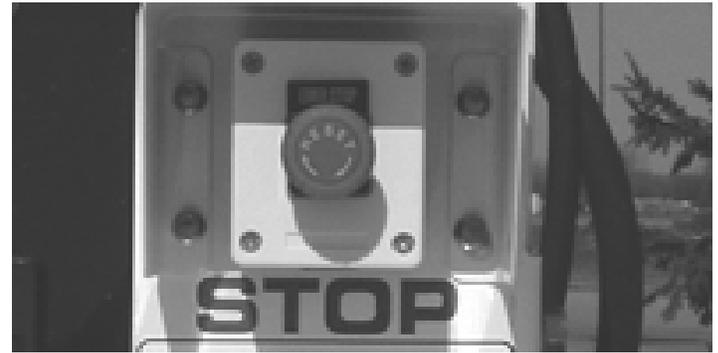
NOTE: If water is to be used during the transplanting process, fill the water tank and be sure to open the water line shut-off valve on the bottom of the tank.

NOTE: If using water during the transplanting process, turn the water switch located below the left emergency stop switch to the DIG position. If general watering is desired, attach a hose to the coupler and turn the water switch to the WASH position.



Always adhere to healthy tree selection and replant trees at the proper elevation and grade (root flare at or above surrounding grade). Perform in-transit tree protection care (water misting, tarping, antidesiccant spraying, etc.). Backfill all voids surrounding the root ball and pit sidewalls. Properly prune the tree, fertilize, and mulch with appropriate materials. Provide regular foliar and root area irrigation allowing for complete hydration/drainage based upon soil texture and water retention characteristics. Perform proper post-transplanting care (i.e. insect and disease control, fertilization, wound/scar repair, supplemental irrigation, stabilization or “staking” as required, and protection from herbicides and other chemical residues).

NOTE: Prior to powering up the transmitter, be sure both emergency stop switches (located on each support) are in their ON (pulled out) position. To bring the switch from the OFF to the ON position, rotate the knob clockwise and allow it to pop out to the ON position.



Receiving Hole

WARNING

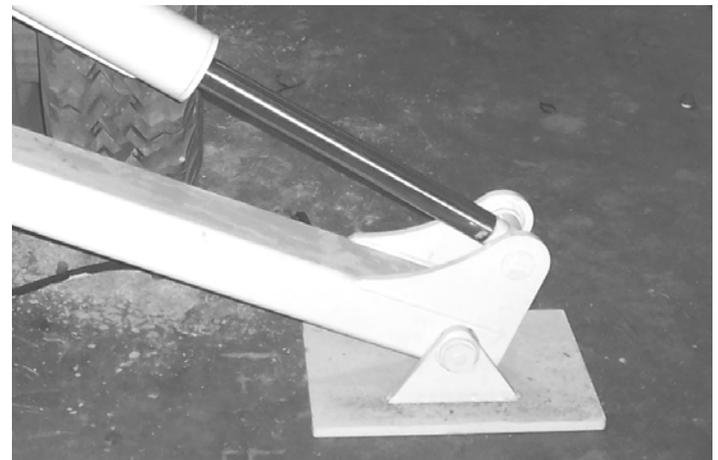
Before operating, locate all overhead and buried lines. Call your locator service.

WARNING

All Operator Precautions must be followed during the transplanting process.

Position the Transplanter at the receiving location and put the transmission in neutral; then set the parking brake and engage the power take off. Using the following procedure, dig the receiving hole. The plug may be transported to the tree removal site to be used as backfill. All Transplanter functions are to be made using the remote control transmitter.

1. Press the transmitter POWER switch for three seconds to power up the transmitter. Once the remote is powered up and while holding the POWER switch, press the SPEED switch to raise the engine rpm to its preset high idle.
2. In turn for each outrigger, activate the OUTRIGGER control switches (4 & 6) until each outrigger pad is firmly positioned on the ground and slightly raises the frame of the truck. If necessary to “parallelize” [make the truck frame parallel (from side to side) with the ground], lower the outrigger on the side of the truck which is the lowest, until the truck frame (from side to side) raises up and is parallel to the ground.



3. Activate the TILT control switch (1) until the Transplanter is approximately vertical to the ground.

NOTE: To increase the speed of the tilt, press the SPEED switch (8) while activating the TILT control switch. Pressing the SPEED switch without simultaneously pressing either the TILT or LIFT switch will drop the engine rpm back to idle.

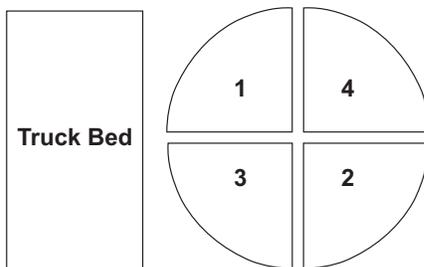
4. Press the Mode switch until Mode **b** is displayed; then using the SPADE control switches (1, 3, 4, & 6) fully raise the the spades.
5. Press the Mode switch until **Mode A** is displayed; then lower the clam to the ground by pressing down on the LIFT control switch (3).

NOTE: To increase the speed of the lift, press the SPEED switch (8) while activating the LIFT control switch.

NOTE: Be sure the gate halves (clam) are locked together prior to the spade insertion process.

6. Press the Mode switch until Mode **b** is displayed; then using a left-front, right-rear, left-rear, right-front spade insertion sequence (control switches 1, 6, 4, & 3), insert the spades, one at a time, using small “jab” strokes. If the ground is hard and the main frame starts to rise from the ground, stop the insertion of that spade and retract slightly until the main frame is back in its original position; then start to insert the spade on the opposite side of the Transplanter. Continue this insertion process until all spades are in the maximum down position.

Spade Insertion Sequence



NOTE: If water is desired to help in the digging process, be sure the water switch located below the left emergency stop switch is in the DIG position; then press the water control switch (9) to the ON position. Press the switch again (to the OFF position) when water is no longer desired.

7. Press the Mode switch until **Mode A** is displayed; then press the LIFT control switch (3) to lift the plug out of the ground. Press the TILT control switch (1) to lay the Tree Transplanter down to the transport position.

WARNING

Do not transport trees or plugs with the Transplanter in the vertical position. Only transport in the stowed position.

8. Press the OUTRIGGER control switches (4 & 6) to raise both outriggers to the transport position.
9. If the hole is to be left unattended, mark or fence the perimeter of the hole according to your State or local regulations.

WARNING

If the hole is to be left unattended, it must be properly marked or fenced to prevent unauthorized access. Safety fencing, reflectors, etc. as required by your State and local authorities must be installed around the hole.

10. Press the POWER switch to turn off the transmitter; then return the transmitter to the stow location.
11. Disengage the power take off; then release the parking brake.

CAUTION

Be sure to disengage the power take off before operating the truck engine at speeds above 1500 rpm. Damage to the hydraulic system or pump may result from excessively high rpm.

12. Once at the dump site, put the transmission in neutral; then set the parking brake and engage the power take off. Press the POWER switch for three seconds to power up the transmitter. Once the remote is powered up and while holding the POWER switch, press the SPEED switch to raise the engine rpm to its preset high idle. Press the OUTRIGGER switches (4 & 6) to lower the outriggers.
13. Press the TILT switch (1) until the Transplanter is approximately vertical to the ground.

NOTE: Remember that during the tilt and lift sequences, the speed of each may be increased by pressing the SPEED switch (8) while holding either the tilt or lift switch.

14. Press the Mode switch until **Mode b** is displayed; then retract the spades to dump the plug using the SPADE control switches (6, 4, 3, & 1). Return the spades to their down position.

NOTE: If necessary to give adequate clearance when returning the spades to their down position, it may be necessary to switch to Mode A to raise the lift assembly slightly; then return to Mode b to return the spades to their down position.

15. Press the Mode switch until **Mode A** is displayed; then press the LIFT control switch (3) to fully raise the lift assembly; then press the TILT control switch (1) to lay the Transplanter down to the transport position.
16. Raise the outriggers (switches 4 & 6) to the transport position.
17. Press the POWER switch to turn off the transmitter; then return the transmitter to the stow location.
18. Disengage the power take off; then release the parking brake.

CAUTION

Be sure to disengage the power take off before operating the truck engine at speeds above 1500 rpm. Damage to the hydraulic system or pump may result from excessively high rpm.

Tree Removal and Planting

WARNING

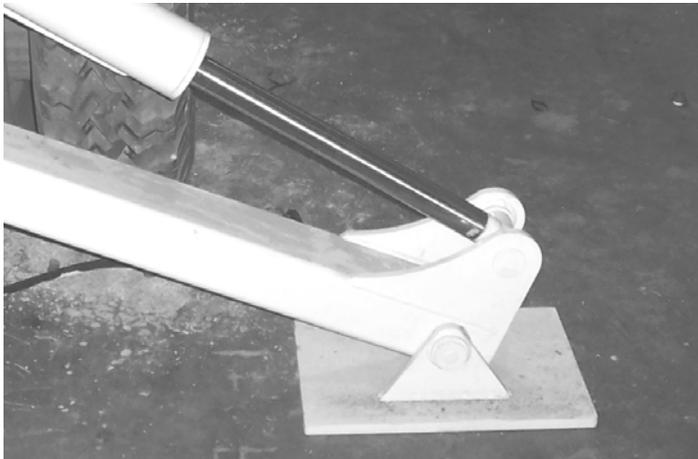
Before operating, locate all overhead and buried lines. Call your locator service.

WARNING

All Operator Precautions must be followed during the transplanting process.

Carefully study the tree removal site to determine the best direction from which to approach the tree. Pay particular attention to surrounding obstacles and the slope of the ground. Generally it is best to remove a tree from the down side of a slope. Position the Transplanter near the tree removal site and put the transmission in neutral; then set the parking brake and engage the power take off. Using the following procedure, remove the tree from its original location.

1. Press the transmitter POWER switch for three seconds to power up the transmitter. Once the remote is powered up and while holding the POWER switch, press the SPEED switch to raise the engine rpm to its preset high idle.
2. In turn for each outrigger, activate the OUTRIGGER control switches (4 & 6) until each outrigger pad is firmly positioned on the ground and slightly raises the frame of the truck. If necessary to “parallelacize” [make the truck frame parallel (from side to side) with the ground], lower the outrigger on the side of the truck which is the lowest, until the truck frame (from side to side) raises up and is parallel to the ground.



3. Activate the TILT control switch (1) until the Transplanter is approximately vertical to the ground.

NOTE: To increase the speed of the tilt, press the SPEED switch (8) while activating the TILT control switch. Pressing the SPEED switch without simultaneously pressing either the TILT or LIFT switch will drop the engine rpm back to idle.

4. Press the Mode switch until Mode **b** is displayed; then using the SPADE control switches (1, 3, 4, & 6) fully raise the the spades.

CAUTION

The spades must be in their fully UP position prior to opening the gate. Damage to the spades will result if not in the UP position when opening the gate.

5. Press the Mode switch until Mode **A** is displayed; then using the following procedure, open the gate.
 - A. Using the RH GATE switch (5), fully **close** the right gate.
 - B. Using the LH GATE switch (2), **open** the left gate.
 - C. Using the RH GATE switch (5), **open** the right gate.

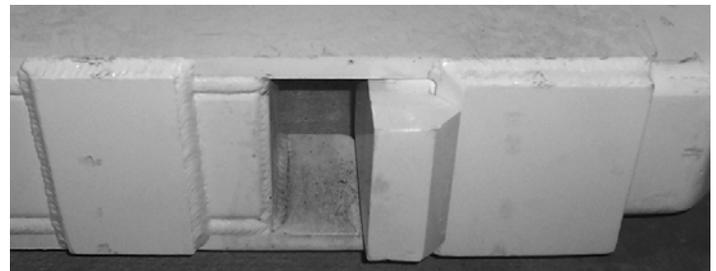
NOTE: Only one gate will operate at a time. Do not attempt to move both gates simultaneously as that will prevent either gate from moving.

6. Press the OUTRIGGER switches (4 & 6), raise each outrigger.
7. Release the parking brake; then slowly back the Transplanter into position until the tree is centered in the Transplanter. Set the parking brake.

WARNING

If the ground is uneven or unstable, use extreme caution and slow speed when moving the Transplanter in the vertical position.

8. Close the gate using the following procedure.
 - A. Using RH GATE switch (5), fully **close** the right gate.
 - B. Using LH GATE switch (2), **close** the left gate.
 - C. Using RH GATE switch (5), slightly **open** the right gate to lock the gate halves together.



CAUTION

The gate halves (clam) must be locked together prior to the spade insertion process.

NOTE: The vertical center line of the Transplanter and tree should be aligned. Fine tune the Transplanter position accordingly prior to lowering the outriggers.

9. Press the OUTRIGGER control switches (4 & 6) until each outrigger pad is firmly positioned on the ground and slightly raises the frame of the truck. If necessary to “parallelacize” the Transplanter, lower the outrigger on the side of the truck which is the lowest, until the truck frame (from side to side) raises up and is parallel to the ground.
10. Lower the clam to the ground by pressing down on the LIFT control switch (3).

NOTE: To increase the speed of the lift, press the SPEED switch (8) while activating the LIFT control switch.

11. Press the Mode switch until Mode **b** is displayed; then using a left-front, right-rear, left-rear, right-front spade insertion sequence (control switches 1, 6, 4, & 3), insert the spades, one at a time, using small “jab” strokes. If the ground is hard and the main frame starts to rise from the ground, stop the insertion of that spade and retract slightly until the main frame is back in its original position; then start to insert the spade on the opposite side of the Transplanter. Continue this insertion process until all spades are in the maximum down position.

NOTE: If water is desired to help in the digging process, be sure the water switch located below the left emergency stop switch is in the DIG position; then press the WATER control switch (9) to the ON position. Press the switch again (to the OFF position) when water is no longer desired.



12. Press the Mode switch until Mode **A** is displayed; then press the LIFT control switch (3) to lift the tree out of the ground. Press the TILT control switch (1) to lay the tree onto the cab headache rack.

NOTE: To increase or decrease the speed of the TILT and/or LIFT, press the SPEED switch (8) while the lift and/or tilt switch is activated. The mast cylinder is designed to automatically slow down as it nears the stowed position.

CAUTION

If transplanting a large, heavy tree, do not speed up the lift or tilt.

WARNING

Do not transport trees or plugs with the Transplanter in the vertical position. Only transport in the stowed position.

13. Press the OUTRIGGER control switches (4 & 6) to raise both outriggers to the transport position.
14. If the hole is to be left unattended, mark or fence the perimeter of the hole according to your State or local regulations.

WARNING

If the hole is to be left unattended, it must be properly marked or fenced to prevent unauthorized access. Safety fencing, reflectors, etc. as required by your State and local authorities must be installed around the hole.

15. Press the POWER switch to turn off the transmitter; then return the transmitter to the stow location.

WARNING

The remote must be turned off and at least one emergency stop switch be depressed before tying and tarping trees or performing any service on the transplanter.

16. Disengage the power take off; then release the parking brake.

CAUTION

Be sure to disengage the power take off before operating the truck engine at speeds above 1500 rpm. Damage to the hydraulic system or pump may result from excessively high rpm.

NOTE: Clean the Transplanter of all loose soil and debris that may fall off during transport. Tarp or tie the tree as desired.

17. Once at the transplant site and with the Transplanter properly positioned near the receiving hole (approximately 65 in. from the centerline of the receiving hole), put the transmission in neutral; then set the parking brake and engage the power take off.

WARNING

Closely inspect the receiving hole to be sure nothing has entered the hole.

18. Press the transmitter POWER switch for three seconds to power up the transmitter. Once the remote is powered up and while holding the POWER switch, press the SPEED switch to raise the engine rpm to its preset high idle.
19. In turn for each outrigger, activate the OUTRIGGER control switches (4 & 6) until each outrigger pad is firmly positioned on the ground and slightly raises the frame of the truck. If necessary to “parallelize” the Transplanter, lower the outrigger on the side of the truck which is the lowest, until the truck frame (from side to side) raises up and is parallel to the ground.
20. Press TILT control switch (1) until the tree is approximately vertical to the ground.
21. Lower the clam until the spades are completely in the receiving hole by pressing down on the LIFT control switch (3).

NOTE: If necessary, press the Mode switch until Mode **b is displayed; then use the appropriate leveler to adjust the verticality of the tree.**

22. Press the Mode switch until Mode **b** is displayed; then retract the spades to transplant the tree using SPADE control switches (6, 4, 3, & 1).
23. Press the Mode switch until Mode **A** is displayed; then raise the clam using the LIFT control switch (3).

CAUTION

The spades must be in their fully UP position prior to opening the gate. Damage to the spades will result if not in the UP position when opening the gate.

24. Using the following procedure, open the gate.

- A. Using the RH GATE switch (5), fully **close** the right gate.
 - B. Using the LH GATE switch (2), **open** the left gate.
 - C. Using the RH GATE switch (5), **open** the right gate.
25. Press the OUTRIGGER switches (4 & 6), raise each outrigger to the transport position.
26. Disengage the power take off; then release the parking brake and slowly move the truck a small distance from the transplant site. Set the parking brake and engage the power take off.

WARNING

If the ground is uneven or unstable, use extreme caution and slow speed when moving the Transplanter in the vertical position.

27. Close the gate using the following procedure.
- A. Using RH GATE switch (5), fully **close** the right gate.
 - B. Using LH GATE switch (2), **close** the left gate.
 - C. Using RH GATE switch (5), slightly **open** the right gate to lock the gate halves together.



28. Press the Mode switch until Mode **b** is displayed; then using SPADE control switches (1, 3, 4, & 6) fully lower the spades.
29. Press the Mode switch until Mode **A** is displayed. Fully raise the frame (switch 3); then tilt to the transport position (switch 1).
30. Press the POWER switch to turn off the transmitter; then return the transmitter to the stow location.
31. Disengage the power take off; then release the parking brake.

CAUTION

Be sure to disengage the power take off before operating the truck engine at speeds above 1500 rpm. Damage to the hydraulic system or pump may result from excessively high rpm.

MAINTENANCE

WARNING

Do not attempt any service on the Transplanter with the key in the ignition of the truck. The engine must be turned off and the key removed prior to servicing. Firmly support any area being serviced and relieve hydraulic pressure prior to servicing any hydraulic components.

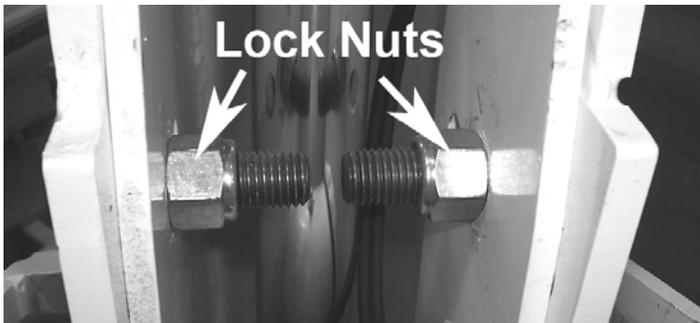
Regular cleaning and lubrication are essential to the longevity of the Transplanter. Prior to beginning any cleaning and/or maintenance, be sure the Transplanter is in a secure position. In addition to the regular cleaning and lubrication, always perform a daily “walk around” checking for any possible conditions that will prevent the Transplanter from functioning properly. Check for loose nuts or bolts, broken or cracked metal and welds, bent or damaged components, and leaking hydraulic components. Any of these conditions may indicate a potentially serious situation.

Check hydraulic hoses regularly. If they are worn or have developed cracks or holes, they can become safety hazards and should be replaced. Replace hydraulic hoses every eight years.

Visually, check the plastic guides (inside each tower) for damage or wear regularly. Replace if binding or excessive play is experienced when raising or lowering a spade.



Weekly, check the torque on spade adjustment lock nuts. Be sure they are tightened to the correct torque (270 ft-lb).



WARNING

Do not attempt any service on the Transplanter if it is not in either the transport position or in a vertical position with either the spades or clam positioned firmly on the ground.

CLEANING

The entire Transplanter should be kept as clean as possible. Use a pressure washer to remove any foreign material from the lift masts, gate, and spades. Allow to thoroughly dry. Using piece of burlap, wipe down the spades to prevent rusting. After a thorough cleaning, immediately lubricate all grease fittings.

NOTE: Prior to storage, a light coating of oil or paint may be applied to the spades to prevent rusting.

HYDRAULIC SYSTEM

The Transplanter hydraulic system should be filled with premium grade HDZ-46 hydraulic fluid. The oil should be good for at least two years unless one of the following problems occur:

1. If the reservoir is **contaminated with excessive water or dirt**. Hydraulic fluid can hold more than 20% water in solution. Usually at these high levels, the fluid will appear milky. A quick test for water at lower concentrations may be performed outside with a hot (>300°P) sheet of steel. With the sheet heated, drop a small amount of hydraulic fluid in the center of the sheet. If it sputters, there is a significant amount of water in the fluid and the fluid should be replaced.
2. If the oil has been **overheated** [above 190° P (87°C)]. The oil will have a foul odor. Do not use oil that has been overheated. The lubricating properties have been destroyed and acids and varnish have been created by oxidation.
3. If a **pump or one of the valves has had a catastrophic failure** resulting in metal fragments and particles entering the fluid. These particles may cause the replacement components to fail before the filter cleans up the system. The filter in a hydraulic system does not filter out 100% of all particles as the fluid passes through it.

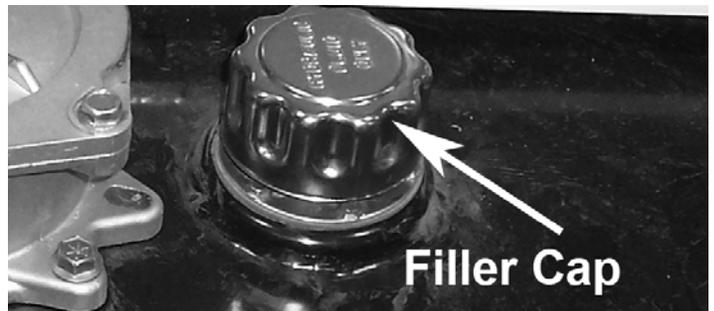
After any of the above have occurred, the entire system should be drained, cleaned, and filled with new fluid. A new filter should always be installed after any maintenance to the hydraulic system.

Whenever service to a hydraulic line, cylinder, or valve is performed where air may enter the system, be sure to cycle the hydraulic controls to remove any air that has entered the system. Air in the hydraulic system may cause the Transplanter to act erratically. This purging of air should be done in a controlled setting prior to any on site work.

WARNING

The Transplanter may not react smoothly until all air is purged from the system.

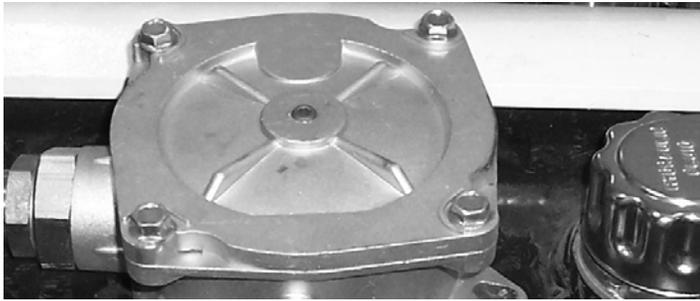
The fluid level in the hydraulic reservoir should be checked daily with all cylinders fully retracted and the Transplanter in the transport position. Any hydraulic leaks should be repaired as soon as possible. Maintain the hydraulic fluid at a level 1 in. above the bottom of the filler cap screen.



FILTER

The hydraulic filter should be changed every six (6) months. To change the filter, use the following procedure:

1. Loosen the four cap screws securing the filter cover on the top of the hydraulic reservoir.



2. While pressing downward, rotate the cover clockwise and remove the cover and spring; then remove the filter. Remove the bypass valve from the top of the old filter.

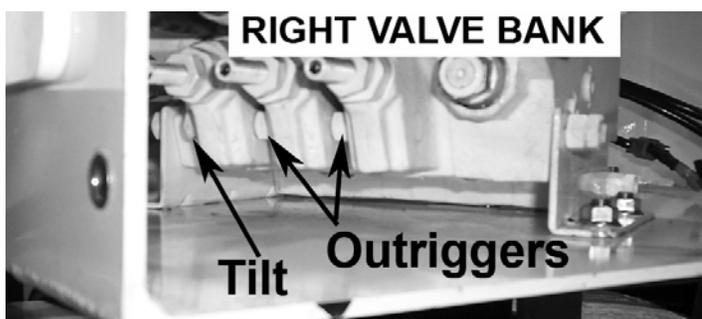
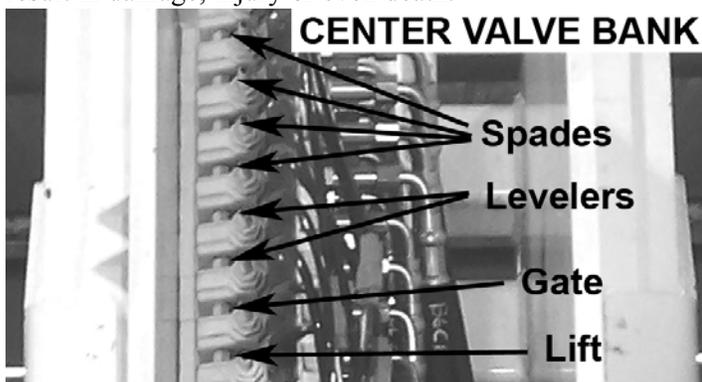
NOTE: The cover is under spring pressure.

3. Place the bypass valve into one end of the new filter; then with the bypass valve positioned on the top, place the new filter into position. Place the spring and cover into position. Make sure the O-ring is properly positioned in the groove of the housing.
4. While pressing downward on the cover, rotate the cover counterclockwise until it is in the proper position beneath the four cap screws; then tighten the cap screws securely.

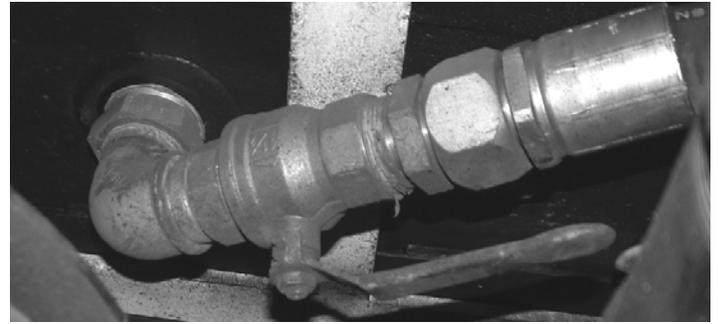
RELIEVING HYDRAULIC PRESSURE

Before performing any work on the hydraulic system, all pressure in the system must be relieved. Place the Transplanter either in the transport position or firmly support the area being serviced. Make sure all parts actuated by hydraulic pressure are supported or otherwise restrained to prevent movement prior to relieving hydraulic pressure.

Disengage the power take off; then turn off the transmitter and stop the truck engine. Remove the appropriate valve bank cover; then using the special 1/2 in. wrench included in the waterproof canister, rotate the hex shaft of the appropriate valve to both ON positions. Residual hydraulic pressure may still be present, so care must be taken. Failure to do so could result in damage, injury or even death.



Once pressure has been relieved, turn the hydraulic shut-off valve (located on the bottom of the hydraulic tank) to the OFF position.



After completing the service on the hydraulic system, install the valve bank cover; then turn the hydraulic shut-off valve to the ON position before the operating the hydraulic system.

CAUTION

The hydraulic shut-off valves must be in the ON position before operating the Transplanter or severe damage to the pump will result.

ADJUSTING SPADE

For consistent digging and minimal machine stress, the spades must be properly adjusted. Differing soil types and conditions will affect the amount and frequency of adjustments. Always be aware of how the Transplanter functions normally and what a good root ball looks like. Digs which consistently fall out of spec are usually a good indication that adjustments need to be made or worn parts replaced.

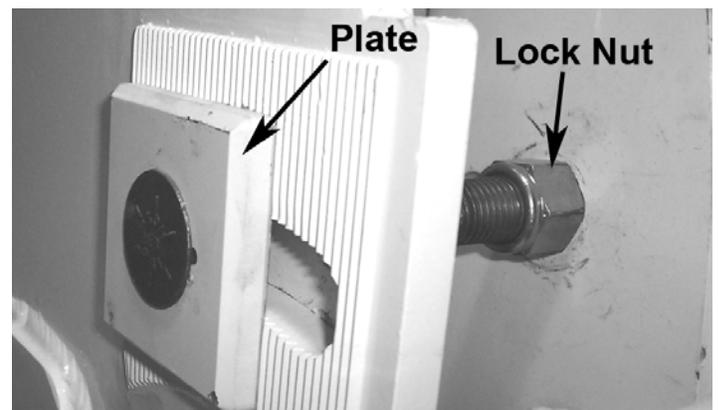
To adjust a spade, use the following procedure.

1. Set the Transplanter in a vertical position and lower the clam to the ground; then fully raise the spades.
2. Turn off the transmitter and the truck engine. Remove the ignition key.

WARNING

Do not attempt any service on the Transplanter with the key in the ignition of the truck. The engine must be turned off and the key removed prior to servicing.

3. On each side of the spade that is to be adjusted, loosen the lock nut securing each adjuster bracket.

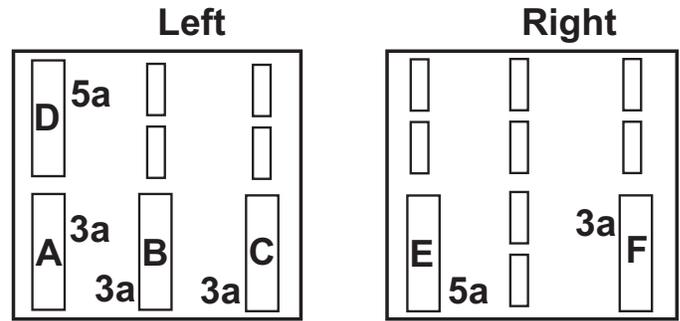


4. Either push in or pull out on the tip of the spade while listening for “clicks” coming from the adjuster plates. Each click relates to one groove on the adjuster plates and is equal to approximately 1/4 in. in spade tip movement.
5. When the spade is properly positioned, tighten both adjuster bracket lock nuts securely (270 ft-lb).
6. Daily, check the lock nuts for proper torque until no further tightening is required.

REPLACING FUSES

Circuits are protected with fuses to prevent overloads. Whenever replacement of a fuse is necessary, always replace with the fuse with one of the same amperage. There are three fuse locations on the Transplanter. An in-line fuse (20 amp) is located in the main wiring harness coming from the key switch of the truck. Two fuse blocks are located immediately below the controller assembly. The following illustration identifies the circuits protected by the fuses in the fuse blocks.

Fuse Blocks



A= Radio Power
 B= High Idle
 C= Controller A Power
 D= Master Relay Power

E= Slave Relay Power
 F= Controller B Power

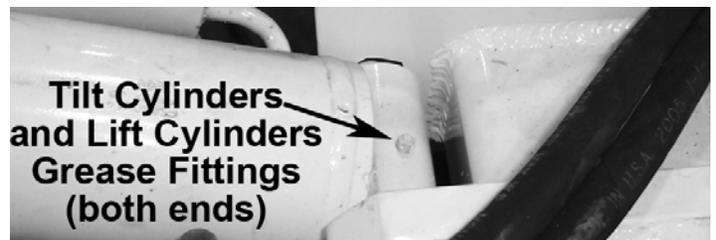
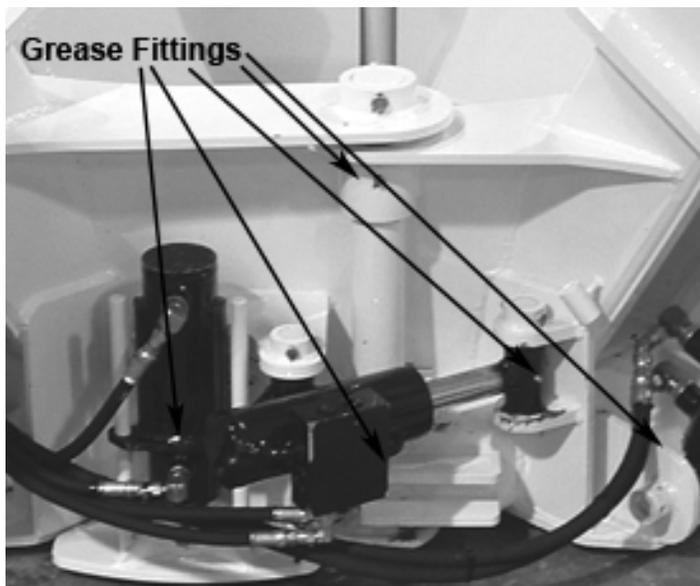
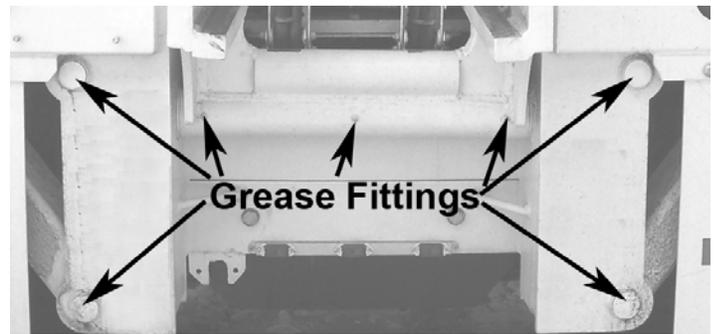
LUBRICATION

All grease fittings should be greased weekly and immediately after ever high pressure cleaning. Two or three strokes should be sufficient for each fitting. Always use the recommended lubricant. Be sure all fittings take grease.

CAUTION

Do not use lubricants that will readily mix with dirt or sand and create an abrasive mixture. Also, do not apply any type of lubricant to the spade slides.

Grease fittings are located on all pivot point shafts and on each end of all cylinders except the two cylinders for the levelers. The following illustrations identify the general location of all grease fittings.



TROUBLESHOOTING

GENERAL INFORMATION

This troubleshooting section is designed to help identify possible conditions adversely affecting the operation of the Transplanter. Solutions are provided for each of these conditions.

Troubleshooting is a process of step by step elimination and isolation. Careful and logical thought processes are an important part of the troubleshooting procedure. Whenever performing any maintenance and troubleshooting on the Transplanter, be sure to observe all safety and hazard information listed in this manual.

TRANSMITTER TROUBLESHOOTING

The transmitter has an LED status indicator to aid in troubleshooting. Due to the rough treatment it may be subjected to, most communication problems are likely to occur in the transmitter. The transmitter should be thoroughly diagnosed before proceeding to the receiver.

WARNING

When testing the transmitter, the receiver may become active resulting in system operation. Always assume the system is working and will respond when testing the transmitter.

LED Indication	Possible Cause
LED is off	Transmitter is off.
LED flashes at low rate	Transmitter is operating in a normal mode.
LED flashes at high rate	Command Switch is pressed.
LED flashes on-off at a slow rate (1/2 second on and 1/2 second off)	Batteries getting low. Batteries should be changed at the next convenient opportunity.
LED remains on continuously	Either a switch was activated at the time the transmitter was turned on or a general failure occurred that requires factory service. Ensure no other switches are pressed while attempting to turn the transmitter on.
LED will not light when ON/OFF button is pushed	Replace batteries. If this does not correct the problem, the transmitter must be repaired.

RECEIVER TROUBLESHOOTING

The receiver uses three basic LEDs for diagnostics (PWR, Signal, and Safety).

LED Indicators	Receiver Action
PWR illuminated.	Receiver operating voltage is present.
SIGNAL flashes.	Signal is being received that matches the decoder's address.
SAFETY illuminated.	One or more command outputs are energized.

Use the following when troubleshooting the receiver.

PWR is not illuminated	Check that the power source to the receiver is active. Check the fuse for the receiver power input.
With transmitter ON, SIGNAL is not illuminated	Check Transmitter batteries Troubleshoot Transmitter
Only some functions operate	Check/replace fuses in fuse blocks Check output voltage of respective electrical circuits. Check condition of transmitter switches.
Intermittent operation	Check all connections and antenna for damage.
Operating range is short	Check antenna connections.

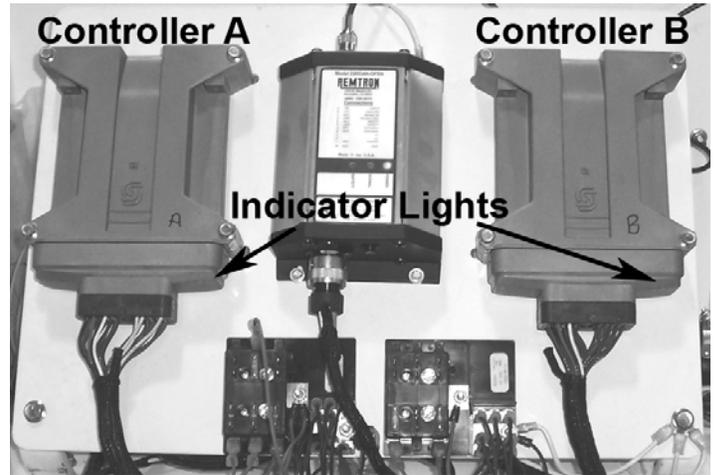
CONTROLLER TROUBLESHOOTING

Each controller has a self-diagnostic function built into its memory for troubleshooting system failures. If the Transplanter will not respond to signals sent by the transmitter and the transmitter has proven to be working properly and the incoming power to the receiver has been verified, check for controller output faults by observing the red indicator light on each controller upon start-up.

If an output fault has been detected, a series of flashes will be given. Count the series and compare it to the following codes. The series of flashes will be repeated three times. A short pause will be present between the first and second number. These codes indicate the particular circuit where either an open or short exists.

Controller A (front)

- 4-1 Engine High Idle
- 4-2 Water Valve
- 4-3 Left Outrigger Extend
- 4-4 Left Outrigger Retract
- 4-5 Right Outrigger Extend
- 4-6 Right Outrigger Retract
- 4-9 Tilt Up
- 5-1 Tilt Down
- 5-2 Lift Up
- 5-3 Lift Down
- 5-4 Left Gate Open
- 5-5 Left Gate Close
- 5-6 Right Gate Open
- 5-7 Right Gate Close



Controller B (rear)

- 4-1 Left Leveler Up
- 4-2 Left Leveler Down
- 4-3 Right Leveler Up
- 4-4 Right Leveler Down
- 4-5 Left-Front Spade Up
- 4-6 Left-Front Spade Down
- 4-7 Right-Rear Spade Up
- 4-8 Right-Rear Spade Down
- 4-9 Right-Front Spade Up
- 5-1 Right-Front Spade Down
- 5-2 Left-Rear Spade Up
- 5-3 Left-Rear Spade Down
- 5-4 Left-Front Water Valve
- 5-5 Right-Rear Water Valve
- 5-6 Right-Front Water Valve
- 5-7 Left-Rear Water Valve